

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 1125.170	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2004/018539	International filing date (<i>day/month/year</i>) 10 June 2004 (10.06.2004)	Priority date (<i>day/month/year</i>) 11 June 2003 (11.06.2003)]
International Patent Classification (IPC) or national classification and IPC 7 F02D 41/30, 19/06, 35/00		
Applicant CLEAN AIR POWER, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

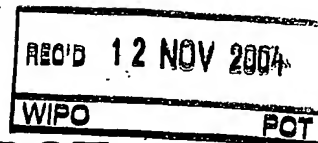
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|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input checked="" type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input checked="" type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Date of issuance of this report 13 December 2005 (13.12.2005)
Facsimile No. +41 22 740 14 35	Authorized officer <div style="text-align: center; font-weight: bold;">Nora Lindner</div> Telephone No. +41 22 338 89 65

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY



PCT

To:

29/12

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2004/018539

International filing date (day/month/year)
10.06.2004

Priority date (day/month/year)
11.06.2003

International Patent Classification (IPC) or both national classification and IPC
F02D41/30, F02D19/06, F02D35/00

Applicant
CLEAN AIR POWER, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1 (a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/018539

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2004/018539

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	4-13,17-19,22-30
	No: Claims	1-3,14-16,20,21,31,32
Inventive step (IS)	Yes: Claims	4-13,17-19,22-30
	No: Claims	1-3,14-16,20,21,31,32
Industrial applicability (IA)	Yes: Claims	1-32
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rules 43*bis*.1 and 70.10)

and / or

2. Non-written disclosures (Rules 43*bis*.1 and 70.9)

see form 210

Re Item V.

- 1 The following documents are referred to in this communication:

D1 : WO 02/077427 A (MOTOROLA INC) 3 October 2002 (2002-10-03)

D2 : US 6 055 963 A (BROWN SCOTT C ET AL) 2 May 2000 (2000-05-02)

2 INDEPENDENT CLAIMS

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Document D2 discloses (the references in parenthesis applying to this document)

-a method comprising an internal combustion engine in a first mode comprising one of a diesel mode ("diesel fuel", col. 1, line 20; "liquid fuel mode", col. 3, line 5) and a pilot ignited gaseous fuel mode ("gaseous fuel...and a pilot amount of liquid fuel is injected into cylinder to ignite the mixture of air and gaseous fuel", col. 3, lines 8-11); then

-operating said internal combustion engine in a second mode comprising the other of said diesel mode and said pilot ignited gaseous fuel mode (col. 3, lines 5-14); and

-during a transition period between said first and second modes, controlling engine operation based on at least one engine ("exhaust gas O2 level / air/fuel ratio", col. 3, line 49 - col. 4, line 11) operating parameter other than total energy fuel content to achieve an at least substantially smooth transition between operating modes.

Document D1 (page 3, lines 28-31 and page 4, line 22 - page 8, line 3) discloses a further method and apparatus comprising all features of independent claim 1 (Article 33(2) PCT).

- 2.2 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 16 is not new in the sense of Article 33(2) PCT.

Document D2 discloses all features of independent claim 16. Reference is made to the above cited references.

- 2.3 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 20 is not new in the sense of Article 33(2) PCT.

Document D2 discloses all features of independent claim 20. Reference is made to the above cited references.

3 DEPENDENT CLAIMS

- 3.1 Dependent claims 2,3, 14, 15, 21, 31 and 32 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step. Reference is made to the references cited in the international search report.
- 3.2 The combination of the features of dependent claim 4 (and 17, 22) is neither known from, nor rendered obvious by, the available prior art. The reasons are as follows: Non of the prior art documents cited in the international search report discloses a method (and apparatus) for the transition from pilot ignited gaseous fuel mode to diesel mode wherein the diesel lambda is controlled to a high value at the beginning of the transition period and is progressively reduced during the transition period.

4 INDUSTRIAL APPLICABILITY

- 4.1 The requirements of the PCT with respect to the industrial applicability (Article 33(4)) of the subject-matter of claims 1-32 seem to be fulfilled.

5 CLARITY

- 5.1 Although claims 1 and 16 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.
- 5.2 Independent claims 1, 16 and 20 are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those fea-

tures known in combination from the prior art (document D2 or D1) being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

In the present case, the features above cited in section 2.1 are known in combination from the document D2 (or D1) and belong in the preamble of such a claim.

- 5.3 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
- 5.4 The vague and imprecise statement in the description on page 4, lines 14-16 implies that the subject-matter for which protection is sought may be different to that defined by the claims, thereby resulting in lack of clarity (Article 6 PCT) when used to interpret them.